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some time in another house; a jute-velour furniture covering, color old rose, also gave the arsenical mirror, and a crêtonne of a black ground with light colored figures and pattern was highly charged with arsenic, even after several years' use as curtains, indicating that use does not eliminate the arsenic. Tests were made of 60 pieces of lately imported English crêtonnes, and only 20 pieces were found to be free of arsenic. In Germany and, of late years, in France, there are laboratories supported by the government, where anyone may take a substance believed to be injurious to health, to be tested free of charge, and, as there is a punishment for selling any such substance, fabrics from these countries are very likely to be free from deleterious matter.

There are two ways in which the arsenic may be disseminated in the air, first, by a chemical action forming arseniuretted hydrogen, which readily comes through any paper that may cover the arsenical one; second, a purely mechanical action, where the arsenical paper is outside, by the pigment or sizing, drying and being carried off as a powder and breathed—both these actions may be taking place with an arsenical outside paper.

SCIENTIFIC NEWS.

The Eighth Session of the Marine Biological Laboratory at Wood's Hole, Massachusetts, will last from June 1 to October 1, 1895. The laboratory is under the general charge of Prof. C. O. Whitman, Director, and Prof. H. C. Bumpus, Assistant Director.

Instruction will be given by the following staff: Howard Ayers, E. G. Conklin, S. Watasé, M. M. Metcalf, C. M. Child, F. R. Lillie, O. S. Strong, H. S. Brode, W. M. Rankin, J. L. Kellogg, P. A. Fish, A. D. Mead, H. E. Walter, W. A. Setchell, W. J. V. Osterhout, Jacques Loeb, W. N. Norman.

There will also be evening lectures on biological subjects of general interest. Among those who may contribute these lectures may be mentioned, in addition to the instructors above named, the following: G. F. Atkinson, E. G. Conklin, J. M. Coulter, A. E. Dolbear, Simon Flexner, E. O. Jordan, William Libbey, Jr.; F. S. Lee, W. A. Locy, J. M. Macfarlane, C. S. Minot, E. S. Morse, H. F. Osborn, W. B. Scott, W. T. Sedgwick, William Trelease, S. Watasé, E. B. Wilson, B. G. Wilder, W. P. Wilson.

The following courses of instruction are offered:

In the laboratory for teachers and students in anatomy which will be open from July 2 to August 30, two courses are offered: the first, in invertebrate anatomy, and the second, a newly arranged course in vertebrate anatomy. Either course may be made preparatory to the course in embryology. The course in invertebrate anatomy will embrace a study of the more typical marine invertebrates, instruction being given by lectures, laboratory work and collecting excursions. The lectures are given each morning, and by those who are specialists in the subject under consideration. For laboratory dissection, each student is supplied with fresh material, and the entire day is spent in study, under the direction of the instructors. Collecting excursions are taken on Wednesdays and Saturdays. The steam launch and boats are freely used, and methods of dredging, skimming, and general collecting are explained. The animals studied will be Grantia, Tubularia, Campanularia, Metridium, Mnemeopsis, Nereis, Phascolosoma, Polyzoa, Bdellura, Molgula, Branchipus, Lepas, Talorchestia, Cancer, Limulus, Asterias, Arbacia, Echinarachnius, Thyone, Venus, Sycotypus, Loligo.

The course in vertebrate anatomy has been arranged for those who desire a thorough study of the vertebrate body. Though primarily a laboratory course, under the direction of the officers of the laboratory, there will be daily lectures upon anatomy, physiology, and kindred subjects by the following lecturers: Professor H. P. Bowditch, Dr. F. S. Lee, Dr. C. F. Hodge, Dr. O. S. Strong, Dr. C. S. Minot, Dr. J. S. Kingsley, Dr. J. P. McMurrich, Dr. H. F. Osborn. The first week will be devoted to the Elasmobranchs, the Dogfish (*Galeus*) and Skate receiving special attention. The second week will be devoted to the higher Fishes. During the third week the Batrachia will be studied. The fourth week will be devoted to the Reptilia.

Instruction in microscopical technique will extend throughout the month. Methods of section-cutting, differential staining, etc., will be taught, and histological preparations of the more important tissues will be made.

The fee for either of the above courses is $40.00, payable in advance. It covers tuition, material for dissection, dissecting instruments, laboratory outlines, drawing paper and instruments, slides and covers, and a supply of glassware and reagents. The laboratory loans, without charge, microtomes and certain other apparatus; there is a small fee, however, for the use of microscopes, and all who can provide themselves with simple and compound microscopes before coming to Wood's Hole, are urged to do so.

Applications should be made, at the earliest convenient date to, Professor H. C. Bumpus (until June 1), Brown University, Providence, R. I.; June 1–September 1, Wood's Hole, Mass.

The laboratory work in botany will be restricted to the study of the structure and development of types of the various orders of the cryptogamous plants. Especial attention will be given to the study of the various species of marine Algæ, which occur so abundantly in the waters about Wood's Hole, and students desiring to give their entire attention to these plants will be encouraged to do so. The Fungi and higher Cryptogams will receive less attention than the Algæ, but will be studied in a few types. Lectures will accompany the laboratory work. The course may be outlined somewhat as follows:

First week: Cyanophyceæ—Lyngbya, Calothrix, Rivularia, Stigonema, Tolypothrix, Anabæna.

Second week: Chlorophyceæ—Spirogyra, Ulva, Enteromorpha, Chætomorpha, Bryopsis, Vaucheria, Œdogonium.

Phæophyceæ—Ectocarpus, Mesogloia, Leathesia, Laminaria, Fucus, Sargassum.

Third week: Rhodophyceæ—Batrachospermum, Nemalion, Callithamnion, Chondriopsis, Rhabdonia.

Fourth week: Phycomycetes—Mucor, Sporodinia, Peronospora, Cystopus, Achlya.

Uredinei—Æcidium, Uredo, Puccinia, Uromyces.

Fifth week: Basidiomycetes—Agaricus, Lycoperdon.

Ascomycetes—Microsphæra, Sordaria, Peziza, Physcia.

Sixth week: Muscineæ—Riccia, Madotheca, Marchantia, Mnium, Tetraphis, Hypnum.

Filicineæ—Dicksonia, Adiantum, Equisetum, Lycopodium, Marsilia, Selaginella.

The tuition for students in the regular course of laboratory work and lectures is $40.00, payable in advance; for students engaged in investigation the tuition is $50.00.

For the course in embryology, the introductory courses in anatomy, or their equivalent, are considered as prerequisites. The course is designed as a preparation for beginning investigation. The aim will therefore be, not only to master the details of development, but also to acquire a thorough knowledge of the method of preparing surface-views, imbedding in paraffin and celloidin, staining and mounting, drawing, reconstructing, modelling, etc. The study will be mainly confined to the fish egg as the best type for elucidating vertebrate development; but the eggs of amphibia and other vertebrates, as well as some invertebrates, will receive attention. Each member of the class will be supplied with material, and be expected to work out the successive steps in development, beginning with the egg just after fertilization. The laboratory work will be conducted by Doctors Lillie and Strong, and accompanied with lectures and seminar work under the Director. The fee for this course is $50.00, and the class is limited to twelve.

Applicants should state what they have done in preparation for such a course, and whether they can bring a complete outfit, viz.: a compound microscope, a dissecting microscope, camera-lucida, microtome, etc. In case these instruments are furnished by the laboratory, an additional fee of $10 will be charged therefor. No application for less than the whole course will be granted.

For those prepared to begin original work, ten tables are reserved in zoology, and the same number in physiology and botany. The introductory and preparatory courses in each department, or an equivalent, are prerequisites for admission to these tables. Ability to read scientific German and French is also required. Special subjects for investigation are assigned to the occupants of tables, and the supervision of the work is so divided that each instructor has the care of but three or four students. In this way all the advantages of individual instruction are secured. All the lectures and the seminar are open to those engaged in such work. The fee is $50.

The forty private laboratories for investigators are distributed as follows:—Zoology, 22. Physiology, 8. Botany, 10.

These rooms are rented at $100 to colleges, societies or individuals.

The general laboratories are for the use of students engaged in special research under the supervision of the Director and his assistants, and for advanced courses preparatory to beginning investigation, such as the course in embryology. There are forty-two tables, of which zoology has twenty-two, physiology ten, and botany ten.

The seminar is especially designed for members of the class in embryology and beginners in investigation, but is open to all. It is expected that all who attend will be provided with the third volume of the Biological Lectures, as this will be made the basis of discussion. Most of the authors of these lectures will be present, and from two to three mornings will be devoted to the consideration of each lecture, and such questions as may be raised.

Wood's Hole is situated on the north shore of Vineyard Sound, at the entrance of Buzzard's Bay, and may be reached by the Old Colony Railroad (two and one-half hours from Boston), or by rail and boat from Providence, Fall River, or New Bedford. Rooms accommodating two persons may be obtained near the laboratory at prices varying from $1.00 to $3.00 a week, and board from $4.00 to $6.00. Board will be supplied to members at The Homestead at $5.00 a week.

The location of the Laboratory at Wood's Hole, gives it exceptional advantages for study and research. The shore is varied by necks, points, flats, gutters, holes, bays and islands; there are numerous fresh-water ponds and lakes in the vicinity; there is no muddy river or city sewerage to pollute the sea-water; the fauna and flora are exceptionally rich; the climate is especially favorable for summer work, and the place is free from the inconveniences and distractions of fashionable summer resorts.

The Laboratory consists of four two-story buildings, with forty private rooms for the exclusive use of investigators, and seven general laboratories. It is supplied with aquaria, collecting apparatus, reagents, glassware, and a limited number of microtomes and microscopes for use in the introductory courses. The investigators' rooms are furnished with glassware and reagents, but not with microscopes and microtomes. No alcohol is supplied beyond what is allowed for the work done in the laboratories; and expensive reagents, such as osmic acid and gold chloride, are not included in the list of free reagents. The laboratory has a steam launch, boats, dredges, and all the apparatus necessary for collecting and keeping alive material reserved for class work or research.

The library is provided with many works of reference and the more important journals of zoology and botany, some of them in complete series. Members of the Laboratory are allowed the use of books from the Library of the Boston Society of Natural History, through the courtesy of the Curator and the Librarian.

A department of laboratory supply has been established in order to facilitate the work of teachers and others at a distance, who desire to obtain material for study or for class instruction. Certain sponges, hydroids, star-fishes, sea-urchins, marine worms, crustaceans, mollusks, vertebrates and marine plants are generally kept in stock, though larger orders should be filed some time before the material is needed. Circulars giving information, prices, etc., may be obtained on application.

Bowdoin College Summer Courses in Science.—Beginning July 9, 1895, and continuing for five weeks, the following courses in science will be conducted by instructors in Bowdoin College at the

Searles Science Building, Brunswick, Maine.

(1) A course in Elementary Chemistry.
(2) A course in Advanced Chemistry.
(3) A course in Physics.
(4) A course in Biology.

These courses are designed especially for teachers, but are open to all earnest workers. It is believed that they will be well adapted to the needs of any student of natural science, giving, for example, an excellent introduction to the study of medicine or pharmacy. They will also be valuable to those who, either as teachers or scholars, are preparing to meet natural science requirements for admission to college. They will consist largely of practical work in the laboratory, and it is doubtful if any college laboratories in the country have superior facilities for this purpose.

Each elementary course will consist of lectures and laboratory work for two hours a day on five days of the week. No exercises will be held on Saturdays. Students in the advanced chemistry course can work in the laboratory as many hours a day as the instructor thinks advisable. A student in a single elementary course is not entitled to more than the regular time of work for that course, ten hours per week.

The fees for the courses, paid invariably in advance, are as follows:

For two or three elementary courses,	$20.
For a single elementary course,	$10.
For advanced chemistry,	$15.

An extra charge will be made for chemicals used and apparatus injured in any course. Experience proves that such charge need not exceed three dollars.

Board and lodging can be obtained in Brunswick at a cost of from $4 to $6 per week.

Occasional evening lectures on scientific topics of a general nature may be expected from the different instructors.

The next Meeting of the American Microscopical Society will he held at Cornell University in Ithaca, N. Y., August 21, 22 and 23, 1895, that is, the week previous to the meeting of the American Association for the Advancement of Science, which is to be held in Springfield, Mass.

The unsurpassed beauty of the location of the University, and the richness of both its terrestrial and aquatic fauna and flora, make this an ideal place for holding the meeting. It is equally attractive to the student of natural history and to those who love beautiful scenery. The facilities of the University and its equipment in all lines for carrying on microscopical work add to the attractiveness of Ithaca as a place of meeting.

The University buildings, which will be held at the disposal of the Society, are especially adapted for the formal presentation of papers, blackboard illustrations, hanging of diagrams, etc., as well as for any demonstration that authors may desire to make. The armory is very convieniently located both for the University and for the city, and a soiree there can hardly fail to be a great success.

Besides the attraction of papers and demonstrations by members, nearly all the opticians have expressed not only a willingness but a desire to be present and make an exhibit of their microscopes and microscopical apparatus, thereby affording the members an opportunity to see all the new and standard apparatus.

A special feature of the coming meeting will be the setting apart of one or more sessions for the reading of papers on methods and demonstration of special or new methods. The chairman of the local committee, Professor W. W. Rowlee, or the President, Prof. S. H. Page, will be glad to receive requests from those who desire to have some specially difficult method or structure elucidated, and an effort will be made to get some member particularly expert in such subject to demonstrate it before the Society.

Summer Zoological Laboratory of the Indiana University will be located at Vawter Park, the highest point on the southwestern shore of Lake Wawasee or Turkey in Kosciusko county. Wawasee is about nine miles long by three miles wide. In the immediate neighborhood are many lakes, some drained into Lake Michigan, others into the Wabash; a short distance to the east is the basin of Lake Erie and still a shorter distance to the west is the Illinois River basin. An hour's ride from the station over the moraine separating the Mississippi system from the St. Lawrence system will bring us to Webster, Tippecanoe and the Barber Lakes of the former system.

RESEARCH.—The main object of the station will be the study of variation. For this purpose a small lake will present a limited, well circumscribed locality, within which the differences of environmental influences will be reduced to a minimum. The study will consist in the determination of the extent of variation in the non-migratory vertebrates, the kind of variation whether continuous or discontinuous, the quantitative variation, and the direction of variation. In this way it is hoped to survey a base line which can be utilized in studying the variation of the same species throughout their distribution. This study should be carried on for a series of years, or at least be repeated at definite intervals to determine the annual or periodic variation from the mean. A comparison of this variation in the same animals in other similarly limited and well circumscribed areas, and in the correlation of the variation of a number of species in these areas will demonstrate the influence of the changed environment, and will be a simple, inexpensive substitute for such expensive experimental work.

INSTRUCTION.—Courses of instruction which ordinarily cannot be given in the University's laboratories during the college year will be offered and credit given on the University's records. The courses are as follows:

1. *Elementary work.* The class will collect, preserve and study a series of animals occurring in the neighborhood of the station. Emphasis will be laid on the nature of the freshwater fauna and the correlation and adaption of organisms. The entire day will be given to collecting excursions, laboratory work and lectures. Individual work Saturdays. No special preparation is needed. (Teachers may collect material for their classes, but alcohol for this purpose will not be furnished).

2. *Embryology* and life history of fishes and other local forms.

3. *Special investigations* in the variation of non-migratory vertebrates and survey of the physical and biological conditions of Lake Wawasee.

Courses 1 and 2 will extend through five weeks beginning June 25th. Course 3 may extend at the pleasure of the investigator till the middle of September.

LECTURES.—A number of biologists will be present for a short time, several of whom have promised to lecture. Among those who will be present are: J. C. Arthur, Purdue University, Slime molds, the fungous-like animals; A. W. Bitting, Purdue University; E. P. Boyer, Chicago High Schools, Biology in the High Schools; R. E. Call, Louisville Manual Training High School, Freshwater molluscs; W. S. Blatchley, State Geologist, Insects and how to collect them; G. Baur, Chicago University, How to study Variation; J. M. Coulter, President Lake Forest University, (Subjects not yet announced); B. W. Evermann, U. S. Fish Commission, Field work of the U. S. Fish Commission; The Red Fish; P. Kirsch, Indiana State Fish Commissioner; L. J. Rettger, Indiana State Normal School, Some topic in physiology; Joseph Swain, President Indiana University, (Subject not yet announced).

State Geological Survey of Kansas.—In conformity with the law under which the University of Kansas is now working, the Board of Regents at a recent meeting formally organized the University Geological Survey of Kansas with Chancellor F. H. Snow, ex-officio Director; Professor S. W. Williston, Paleontologist; Professor Erasmus Haworth, Geologist and Mineralogist; and Professor E. H. S. Bailey Chemist.

In addition to these, other members of the University Faculty, as well as the advanced students of the departments of Geology and Paleontology, will be engaged upon the work of the Survey. An effort will also be made to centralize and unify the energies of different geologists in the State who have been doing valuable work along different lines of geological investigations. Already a considerable start has been made and the co-operation of different geologists of the State has been secured.

Work in the Coal Measures of the State has been in progress for two summers, and Volume I of the Report is now almost ready for publication. Other volumes will appear at irregular intervals. Those already under preparation are : One on Coal, Oil and Gas; one on the Vertebrate Paleontology of the State; and one on the Salt and Gypsum deposits of Kansas.

The Summer Course of the University Extension Association will be held at the University of Pennsylvania in July, 1895, the course in Biology extending from July 1st to 26th. The lectures and laboratory courses will be conducted by L. H. Bailey (Cornell), E. D. Cope (Pennsylvania), G. L. Goodale (Harvard), B. D. Halsted (Rutgers), J. M. Macfarlane (Pennsylvania), J. S. Kingsley (Tufts), C. O. Whitman (Chicago), W. P. Wilson (Pennsylvania), L. L. W. Wilson (Philadelphia Normal School).

The Missouri State Horticultural Society will hold its Semi-Annual Meeting at the Opera House, Willow Springs, Mo., June 4, 5 and 6, 1895. The Kansas City, Ft. Scott and Memphis and Central Branch Railways will give a rate of half fare for round trip. The San Francisco and Missouri Pacific Railroads will give a rate of one and one-third fare on the certificate plan. Hotels will give rates of $1.00 per day and 75 cents per day.

The Colorado State Science Teachers' Association held its first meeting—since its organization in December last—in Denver, April 3d inst. The object of the association is to promote a better grade of instruction in the elementary schools and high schools of the State.

The Lehrbuch der praktischen vergleichenden Anatomie of Vogt and Yung is at last complete. It was begun in 1885.

The German Zoological Society will hold its annual meeting at Strasburg, June 4–8, 1895.

One boa in the zoological gardens of London recently swallowed another of his species which nearly equalled him in size.

Dr. Lewis R. Gibbes, of Charleston, S. C. died in that city, November 21, 1894. He was born there Aug. 14, 1810. In his early days he he was an ardent zoologist and the Proceedings of the Elliot Society (of which he was one of the founders) the American Association for the Advancement of Sciences and other journals formerly contained numerous systematic papers from his pen. Since the war he has left the zoological field, and has occupied the chair of mathematics and astronomy in the college of Charleston.

Dr. Bela Haller, well-known for his Molluscan studies, is now privatdocent at Heidelberg.

The bibliographical movement recorded in the columns of our January issue is making considerable progress towards its complete organization. The ultimate success of the undertaking now seems highly probable. In France, the organization has reached its greatest perfection and as an example of what is needed in America we may briefly describe what has been done by a number of zealous French zoologists. The annual meeting of the French Zoological Society held in February, 1894 had already discussed the matter in a preliminary way and had referred the decision to the Council of the Society. After mature consideration the Council of the Society designated one of its members, Prof. Bouvier, vice-president of the Society to study all the details of the project and to report upon them at a subsequent meeting. This report of M. Bouvier was presented in February last and was unanimously approved by the Council who ordered it to be presented before the Annual Reunion of February 28.

Basing its decisions upon this report as well as upon the recommendations of the Council, the Society nominated a permanent central *Commission de patronage et de propagande* comprising the following persons: —Prof. Blanchard, Prince Bonaparte, Prof. Delage, Prof. Filhol, Prof. Gandry, Baron de Guerne, Prof. Milne-Edwards, Prof. Raillet and Prof. Vaillant. As associate members twenty zoologists chosen to represent the various publishing centres of the country were nominated. It is through their agency that the central commission hopes to reach every part of France and to secure all the strictly zoological publications needed for the Bureau's work. Journals rarely containing zoological papers as well as any zoological journals or books which the Bureau should be unable to obtain will be examined by a body of eleven special correspondents who have been secured for this purpose. They are distributed as follows. Prof. Bouvier, Botany, Chemistry, and Pharmacology; Prof. Baudouin, Anthropotomy, Physiology, Pathology, and Medicine; Prof. Hervé, Anthropology; Prof. Lignières, Veterinary Science; M. Roché, Chief Inspector of Fisheries, Pisciculture; M. Caustier, Sec. Soc. Acclimatization; M. Boule, Asst. in the Nat. Hist. Museum, Vertebrate Palæontology, M. Haug, Instructor in the Faculty of Science, Invertebrate Palæontology; M. Denicker, Chief Librarian of the Nat. Hist. Museum, Separate Books and certain journals accessible in the Nat. Hist. Library; M. Léveillé, Librarian of the Entomological Society, Books and Journals accessible in the Entomological Library; M. Richard, Sec. Zool. Soc., Journals accessible in the Zoological Society's library or in that of this Philomathic Society and the Society ordered; M. Bouvier's report to be printed and distributed at once.

A preliminary inquiry among a number of learned societies and the leading publishing firms of Paris seems to indicate that almost all the journals as well as the separate works of interest for the Bureau will be sent to it gratuitously. Publishers and learned societies alike can only profit by having their publications made known promptly to those persons who would wish to use them. *Not a single failure to accept the invitation to co-operate has thus far been encountered.*

In Russia also a distinct advance has been made in the last two months; but the conditions are here too different to serve as a model for what we hope may soon be accomplished in America.

The Third International Zoological Congress will meet at Leyden, Holland, September 16–21, 1895. The Netherlands' Zoological Society has taken upon itself the task of making all the arrangements for the meeting. Their Excellencies, the Minister of the Interior, and of the Public Works, of Commerce and Industry, will be the Honorary Presidents of the Congress; Dr. P. P. C. Hoek (Helder), General Secretary, and Dr. R. Horst (Leyden) Treasurer. The following scheme for the Sectional Meetings has been adopted: 1*st section,* General Zoology, Geographical Distribution, including fossil faunas; The Theory of Evolution.—2*d Section,* Classification of Living and Extinct Vertebrates, Bionomy, Geographical Distribution, including Fossil Vertebrates.—3*d Section,* Comparative Anatomy of Living and Extinct Vertebrates; Embryology.—4*th Section,* Classification of Living and Extinct Invertebrate Animals; Bionomy.—5*th Section,* Entomology. 6*th Section,* Comparative Anatomy and Embryology of Invertebrate Animals.

The circular of announcement for the meeting has been signed by 310 Zoologists.